REMARKS

I. Status Summary

Claims 1-108 are pending in the present application. Claims 5-9, 22-96, and 102-107 are withdrawn from consideration. Claims 1-4, 10-21, 97-101 and 108 presently stand rejected. Claims 1 and 108 have been amended. Support for the amendments to claims 1 and 108 can be found in Figures 12 and 13. Figures 12 and 13 clearly illustrate the structure as claimed in claims 1 and 108. Further, Applicants respectfully submit that claims 1-4, 10-21, 97-101, and 108 are in condition for allowance, as discussed in greater detail below. Reconsideration of the application and entry of the amendment is respectfully requested.

II. Interview Summary

Applicants conducted a telephonic interview with Examiner Andrew Piziali on May 15, 2007. Participating in the telephonic interview with Examiner Piziali were applicants' attorney, David M. Sigmon, and an inventor, Dr. Anuj Dhawan. Applicants sincerely appreciate Examiner Piziali's time and consideration in agreeing to and participating in the telephonic interview. It is applicants' understanding that no agreement was reached between the applicants and Examiner Piziali during the telephonic interview. Applicants respectfully submit that the remarks presented herein are believed to be consistent with and also summarize the positions presented by the parties during the telephonic interview.

Concerning the discussion in the Interview of the support for the amendments made in the last amendment to claim 1, applicants respectfully direct the Examiner's attention to the description on page 18, lines 15-21, of the originally filed application that describes that coaxial structures can be formed while a fabric is being woven. Further, applicants direct the Examiner's attention to the description starting on page 24, line 16, of the originally filed application that further describes coaxial structures that can be formed while a fabric is being woven. Such description includes explanations of examples illustrated in Figures 12 and 13. Original claim 1 reads on such a yarn structure.

Concerning the discussion in the Interview regarding the election of species, applicants submit that the elected species and sub-species best fit the structure being claimed. In the original species election requirement, applicants were directed to elect from a species of coaxial structures (Figure 1), twisted structures (Figure 2), and braided coaxial structures (Figure 25). Applicants elected coaxial structures. Further, applicants were required to make a sub-species election requirement between woven coaxial structures, weft knitted coaxial structures, and warp knitted coaxial structures. Applicants elected "a coaxial conductive yarn and woven structure and/or process of making." (See applicants' response to the Species Election Requirement dated April 29, 2005.) Applicants respectfully submit that the coaxial yarn structure of claim 1 created by weaving falls under the species elected by the applicants, because claim 1 recites a coaxial conductive structure made during a weaving process, which corresponds exactly to the language of the elected

species. In the coaxial yarn structure created by weaving, one conductive yarn extends in one direction with at least one other conductive yarn wrapped around it. The conductive yarns are not twisted around each other as in a twisted pair structure. Even in structures where three yarns are used, two of the conductive yarns (which may be twisted together) will be wrapped around the other conductive yarn in a coaxial fashion. Thus, Applicants submit that coaxial yarn structures formed during weaving best fit under the species and sub-species as elected.

Applicants also note that Figure 12 and 13 on which claim 1 is readable were omitted from the original species election requirement. Both Figures 12 and 13 illustrate coaxial structures formed during weaving, and, for the same reasons stated above, constituted examples of the elected species and subspecies.

III. Claim Rejections under 35 U.S.C. § 102

Claims 1 and 4 were rejected under 35 U.S.C. § 102(b) as anticipated by U.S. Patent No. 2,073,923 to Herbst (hereinafter, "Herbst"). Claims 1 and 4 were rejected under 35 U.S.C. § 102(b) as anticipated by U.S. Patent No. 1,745,096 to Jayne (hereinafter, "Jayne").

III. A. Summary of the Rejected Independent Claims under 35 U.S.C. § 102(b)

Independent claim 1 of the present application is directed to a coaxial conductive yarn structure that includes at least a first conductive yarn and a second conductive yarn. The first conductive yarn extends in a first direction and has a

plurality of first conductive strands being twisted together. The second conductive yarn has a plurality of second conductive strands being twisted together. The second conductive yarn is woven in a fabric in the first direction such that the first conductive yarn and the second conductive yarn pass over opposite sides of yarns in the fabric extending in a second direction transverse to the first direction of the first conductive yarn, and the second conductive yarn crossing the first conductive yarn in alternating directions between those yarns extending in the second direction during a process of weaving the first and second conductive yarns in a fabric. At least one insulating layer electrically isolates the first and second conductive yarns from each other. Further, the first and second conductive yarns exhibit at least one of sufficient flexibility, conformability, resiliency, bending characteristics, and recovery for incorporation in a wearable garment.

III. B. Arguments Against the Rejection of the Claims under 35 U.S.C. § 102(b)

Regarding claim 1, applicants respectfully submit that neither Herbst nor Jayne, disclose each and every feature of claim 1. In particular, these references do not disclose a coaxial conductive yarn structure having a second conductive yarn being woven in a fabric in the first direction such that the first conductive yarn and the second conductive yarn pass over opposite sides of yarns in the fabric extending in a second direction transverse to the first direction of the first conductive yarn, and the second conductive yarn crossing the first conductive yarn in alternating directions between those yarns extending in the second direction during a process of weaving

the first and second conductive yarns in a fabric. Both Herbst and Jayne only disclose wrapping a conducting wire around a ground wire so that the conducting wire encircles the ground wire.

Herbst discloses radio frequency energy distribution systems that employ transmission lines for distributing collected broadcast energy to a variety of independent radio receivers. (See Herbst, col. 1, lines 1-9.) The transmission line **2** can comprise a pair of conductors **5**, **6**. The conductor **6** is spiraled around conductor **5** such that the conductor **6** encircles the conductor **5**. (See Herbst, col. 2, lines 14-19.)

Jayne discloses an antenna for radio receiving sets generally having conductors with a ground wire extending in a first direction with an antenna lead wrapped around the conductors and/or ground wires. (See Jayne, col.1, lines 1-2; col. 2, lines 57-85.) The antenna lead can be a wire that is wound spirally about the ground wire and conductors such that the antenna lead encircles the ground wire and conductors. (See Jayne, col. 3, lines 34-46.)

Both Herbst and Jayne disclose outer conductors that spiral around an inner wire so that the outer wire encircles the inner wire. Neither Herbst nor Jayne disclose a coaxial conductive yarn structure having a second conductive yarn being woven in a fabric in the first direction such that the first conductive yarn and the second conductive yarn pass over opposite sides of yarns in the fabric extending in a second direction transverse to the first direction of the first conductive yarn, and the second conductive yarn crossing the first conductive yarn in alternating directions between

those yarns extending in the second direction during a process of weaving the first and second conductive yarns in a fabric.

Therefore, for at least the reasons above, claim 1 is not anticipated by either Herbst or Jayne. Further, since claim 4 depends from claim 1, claim 4 is not anticipated by either Herbst or Jayne. Thus, the rejections of claims 1 and 4 under 35 U.S.C. § 102 should be withdrawn and the claims allowed at this time.

IV. Claim Rejection - 35 U.S.C. § 103

Claims 1, 4, 97 and 98 stand rejected by the Examiner under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No 2,073,933 to Herbst (hereinafter "Herbst") in view of any one of U.S. Patent No. 3,277,564 to Webber et al. (hereinafter "Webber"), U.S. Patent No. 4,931,616 to Usui et al. (hereinafter "Usui"), or U.S. Patent No. 4,590,120 to Klein (hereinafter "Klein").

Claims 1, 4, 97 and 98 stand rejected under 35 U.S.C. § 103(a) as being upatentable over U.S. Patent No. 1,745,096 to Jayne (hereinafter "Jayne") in view of any one of Webber, Usui or Klein.

Claims 2 and 3 stand rejected under 35 U.S.C. § 103(a) as being upatentable over Herbst in view of any one of Webber, Usui or Klein as applied to claims 1, 4, 97, and 98 above, and further in view of U.S. Patent No. 3,795,760 to Raw et al. (hereinafter "Raw").

Claims 2 and 3 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Jayne in view of Webber, Usui or Klein as applied to claims 1, 4, 97 and 98 above, and further in view of Raw.

Claims 10-12, 15-21, 99, and 108 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,906,004 to Lebby et al. (hereinafter "Lebby") in view of Herbst and further in view of U.S. Patent No. 4,552,989 to Sass (hereinafter "Sass").

Claims 13 and 14 stand rejected under 35 U.S.C. § 103(a) as being upatentable over Lebby in view of Herbst in view of Sass as applied to claims 10-12 and 15-21 above, and further in view of Raw.

Claims 99-101 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Lebby in view of Herbst in view Sass as applied to claims 10-12 and 15-21 above, and further in view of any one of Webber, Usui or Klein. Each of these rejections is respectfully traversed.

IV. A. Summary of the Rejected Independent Claims under 35 U.S.C. § 103

Independent claim 1 of the present application is directed to a coaxial conductive yarn structure that includes at least a first conductive yarn and a second conductive yarn. The first conductive yarn extends in a first direction and has a plurality of first conductive strands being twisted together. The second conductive yarn has a plurality of second conductive strands being twisted together. The second conductive yarn is woven in a fabric in the first direction such that the first conductive

yarn and the second conductive yarn pass over opposite sides of yarns in the fabric extending in a second direction transverse to the first direction of the first conductive yarn, and the second conductive yarn crossing the first conductive yarn in alternating directions between those yarns extending in the second direction during a process of weaving the first and second conductive yarns in a fabric. At least one insulating layer electrically isolates the first and second conductive yarns from each other. Further, the first and second conductive yarns exhibit at least one of sufficient flexibility, conformability, resiliency, bending characteristics, and recovery for incorporation in a wearable garment.

Independent claim 10 of the present application is directed to a woven electrical network. The woven electrical network includes a first coaxial conductive yarn structure being woven into a fabric in a first direction. The first coaxial conductive yarn structure includes an inner conductive yarn and an outer conductive yarn being wound around the inner conductive yarn in a second direction transverse to the first direction and substantially covering the inner conductive yarn. At least one insulating layer electrically isolates the inner and outer conductive yarns from each other with the outer conductive yarn being connected to ground. The woven electrical network also includes a second coaxial conductive yarn structure being woven into the fabric in the first direction and being spaced from the first coaxial conductive yarn structure. The second coaxial conductive yarn structure includes an inner conductive yarn, an outer conductive yarn being wound around the inner conductive yarn in a second direction transverse to the first direction and

substantially covering the inner conductive yarn. An insulating layer electrically isolates the inner and outer conductive yarns from each other with the outer conductive yarn being connected to ground. The woven electrical network further includes an AC signal source being connected to the inner conductive yarn of the first coaxial conductive yarn structure for sending an AC signal over the first coaxial conductive yarn structure. The grounded outer conductive yarns of the first and second coaxial conductive yarn structures block electromagnetic fields emanating from the inner conductive yarn of the first coaxial conductive yarn structure and thereby reduce crosstalk between the first and second coaxial conductive yarn structures.

IV. B. Arguments Against the Rejection of the Claims under 35 U.S.C. § 103

Regarding claim 1, Applicants respectfully submit that Herbst, Webber, Usui, or Klein, either singularly or in combination, do not disclose, teach, or suggest each and every feature of claim 1. Similarly, claim 1 and the claims that depend therefrom are not rendered obvious by Jayne in view of Webber, Usui, or Klein. In particular, these references do not disclose, teach, or suggest a coaxial conductive yarn having a second conductive yarn being wrapped around a first conductive yarn during a weaving process in a second direction transverse to a first direction in which the first conductive yarn extends.

For the reasons stated above, neither Herbst nor Jayne disclose, teach or suggest a coaxial conductive yarn structure having a second conductive yarn being

woven in a fabric in the first direction such that the first conductive yarn and the second conductive yarn pass over opposite sides of yarns in the fabric extending in a second direction transverse to the first direction of the first conductive yarn, and the second conductive yarn crossing the first conductive yarn in alternating directions between those yarns extending in the second direction during a process of weaving the first and second conductive yarns in a fabric.

Webber discloses a process of forming a plurality of filaments. Larger diameter wire is annealed and drawn until the final outer diameter of the wire is a fraction of its original diameter such that the wires constitute filaments. (See Webber, col. 3, lines 35-55 and examples 1-6.) Usui discloses the use of thin conductors with the diameter of 20 microns used within a flat cable and Klein discloses the use of thin conducting fiber that are covered by a transparent partially conductive layer of plastic material to produce a chair mat that is relatively free of static.

Herbst, Jayne, Webber, Usui, or Klein, either alone or in combination, do not disclose, teach, or suggest a coaxial conductive yarn structure having a second conductive yarn being woven in a fabric in the first direction such that the first conductive yarn and the second conductive yarn pass over opposite sides of yarns in the fabric extending in a second direction transverse to the first direction of the first conductive yarn, and the second conductive yarn crossing the first conductive yarn in alternating directions between those yarns extending in the second direction during a process of weaving the first and second conductive yarns in a fabric. Thus, these

references, either alone or in combination, do not render claim 1 or the claims that depend therefrom, including claims 4, 97, and 98, obvious.

Claims 2 and 3 stand rejected as being unpatenable over Herbst in view of Raw and Herbst in view of any one of Webber, Usui, or Klein and further in view of Raw. Further, Claims 2 and 3 stand rejected as being unpatenable over Jayne in view of Raw and Jayne in view of any one of Webber, Usui, or Klein and further in view of Raw.

As stated above, Herbst, Jayne, Webber, Usui, and Klein, either alone or in combination, do not disclose, teach, or suggest all the features of claim 1 or the claims that depend therefrom. Claims 2 and 3 depend from claim 1. Therefore, Herbst, Jayne, Webber, Usui, or Klein, either alone or in combination, do not render obvious claims 2 and 3.

Raw discloses a single wire cable conductor consisting of an inter part of an aluminum alloy of the kind known that is non-heat treatable and bonded to the inter part and outer part of a copper or high-conductive copper alloy. (See Raw, col. 1, lines 29-43.) The single wire cable may have an insulating covering of polyvinyl chloride. (See Raw, col. 4, lines 31-38.) However, Raw does not disclose, teach, or suggest a coaxial conductive yarn structure having a second conductive yarn being woven in a fabric in the first direction such that the first conductive yarn and the second conductive yarn pass over opposite sides of yarns in the fabric extending in a second direction transverse to the first direction of the first conductive yarn, and the second conductive yarn crossing the first conductive yarn in alternating directions

between those yarns extending in the second direction during a process of weaving the first and second conductive yarns in a fabric. Thus, Herbst, Jayne, Webber, Usui, Klein, or Raw, either alone or in combination, do not disclose, teach, or suggest all features of claims 2 and 3.

Concerning independent claim 10, applicants respectfully submit that claim 10 is not rendered obvious by Lebby in view of Herbst and further in view of Sass. In particular, no reason to combine Lebby, Herbst, and Sass exists, because these references teach away from their combination as suggested by the Examiner.

Lebby does not disclose, teach, or suggest a textile fabric with integrated electrically conductive fibers that provides only a wired coupling between the textile fabric and portable electronic device. Lebby discloses a textile fabric with integrated electrically conductive fibers that provide sufficient current to induce either a wired or wireless coupling between the textile fabric and a portable electronic device. (See Lebby, col. 2, lines 25-40.) This assertion is supported throughout the specification of Lebby. For example, in stating the objectives of the invention, Lebby states "a textile fabric and clothing fabricated thereof, that incorporates electrically conductive fibers, thus emanating an electromagnetic field for inductive coupling and alternatively providing for a wired coupling would be highly advantageous." (See Lebby, col. 1, lines 57-61, emphasis added.) Further, Lebby also states "it is a further purpose of the present invention to provide for a textile fabric that allows for a wired, a wireless, or an inductive interconnect to small portable electronic devices, e.g., a pager, a cellular telephone, a datebook, a clock/alarm, an informational wire

service receiver, a micro-recording device, a SMART CARD reader, or the like." (See Lebby, col. 1, line 66-col. 2, line 4, emphasis added.)

As stated in the Summary of the Invention of Lebby, the fabric is characterized as emanating an electromagnetic field for wireless interface or could be used with a wired interface. (See Lebby, col. 2, lines 25-40.)

Concerning the detailed description, no embodiment is disclosed or taught that only uses wired communications. Lebby specifically states that "in one embodiment, the electronics and/or device components of the portable electronic device would be established with the textile fabric, and more particularly, the article of clothing made of the inventive textile fabric, utilizing a wired connection, a wireless connection, or through inductive coupling." (See Lebby, col. 3, lines 24-36, emphasis added.) Figure 1 and 2 shows such an embodiment and also states when describing the electrically conductive fiber **12** that the material from which it is made allows for "sufficient current to induce wired or wireless coupling between the textile fabric and the portable electronic device." (See column 4, lines 1-7.) Thus, Lebby clearly discloses that this one embodiment allows wireless connection, wired connection and inductive coupling. All the other embodiments disclosed in Lebby disclose the use of a fabric which includes metallic threads along with holographic optical fibers or an embodiment which includes all metallic threads which can operate as an antenna. No embodiment is disclosed in Lebby that is only used for a wired connection. Thus, Lebby has a clear purpose to provide a single fabric that can provide both wireless and wired coupling. More importantly, the fabrics of Lebby have a principle of

operation that provides both wired and wireless coupling. In order for Lebby to allow for the possibility of wired and wireless connection, the wires must adequately emanate an electromagnetic field.

Herbst, as described above, discloses a transmission line with a grounded conductor extending in a first direction with a second conductor for carrying a high potential signal through the transmission line being spiraled around the grounded conductor. (See Herbst, col. 7, lines 20-37.) The conductor carrying the signal for the transmission line is wrapped around the ground conductor such that the signal carrying conductor is on the outside of the transmission line as stated in Herbst. This design allows the transmission line to not be broken at intervals for the insertion of loading coils. (See Herbst, col. 1, lines 19-21.) This is accommodated by having the signal-carrying conductor wrapped around the grounded conductor.

Sass, on the other hand, discloses a multi-conductor cable including a plurality of miniature coaxial conductor pairs. (See Sass, abstract.) Each coaxial conductor pair includes an inner conductor supported by a very thin tubular layer of solid, relatively stiff dielectric material. (See Sass, col. 2, line 24-31.) The tubular layer is much stiffer and harder than polyvinyl chloride insulating material which is commonly used to insulate conductors. (See Sass, col. 2, lines 31-40.) The tubular layer provides mechanical support opposing short radius bending of the inner conductor of each coaxial pair thereby eliminating the flexibility of the coaxial pair. Id. The tubular layer is surrounded by insulation wrapping having a considerably larger radial thickness than that of the tubular layer. The wrapping is of a dielectric filament or

tape material. Surrounding the wrap is an outer conductor composed of a plurality of strains of wire. (See Sass, col. 2, lines 41-55.) The outer conductor may then be wrapped in a dielectric friction-resistant film. (See Sass, col. 2, lines 56-59.) As stated in Sass, the outer conductors may be at a single ground potential. (See Sass, col. 2, line 60-col. 3, line 4.)

First, to combine the teaching of Sass with the teachings of Herbst and Lebby, would destroy the principle of operation and frustrate the intended purpose of the Lebby. Having a grounded conductor wrapped around the signal carrying conductor would prevent the emanation of the needed electromagnetic field. By having a wire wrapped around a conductive wire in which the outer wire carries a ground, the ability for the fabrics in Lebby to produce a wireless coupling or an inductive coupling is severely frustrated. Thus, one of ordinary skill in the art would not look to the teachings of Sass to be incorporated into a fabric of Lebby in a manner described. Such construction would destroy the principle of operation of Lebby of providing a fabric that allows wired and wireless coupling. Thus, Lebby teaches away from the combination of the coaxial wire taught by Herbst and used in a manner taught by Sass.

Second, such a combination of Lebby with Herbst and Sass is further complicated in that neither Herbst nor Sass disclose, teach or suggest such a coaxial structure made of a yarn. As stated above, Herbst only teaches wires wrapped around an inner conductive core. Such wires are rigid and hold the coiled shape in which they are positioned. Yarns do not operate in such a manner and require a

frictional engagement which is not required by Herbst or Sass. Both Herbst and Sass use wires or tapes which have a rigid component that allow them to be easily wrapped around the inner coil without worry of the outer wire staying in place. Such a construction cannot happen with a yarn without specific processing. Thus, one of ordinary skill in the art would know that wires with a rigidity taught by Herbst and Sass cannot be woven into a fabric as in Lebby due to that rigidity which would cause the wires to bend and break during the rigorous and violent weaving process. One of ordinary skill in the art would also recognize that the yarns as disclosed in the present application could not hold the shape as disclosed in Herbst and Sass. Therefore, applicants respectfully submit that the components of a yarn as disclosed in claim 10 and defined in the specification are not met by Herbst or Sass.

Therefore, for the reasons stated above, one or ordinary skill in the art would have no reason to combine Lebby, Herbst and Sass and would be discouraged to make such a combination due to the intended purpose of Lebby and the fact that such a combination would destroy the principle of operation of Lebby. Further, one of ordinary skill in the art would be discouraged by the rigid structures of Herbst and Sass.

For these reasons set forth above, claim 10 and the claims that depend therefrom, including claims 11, 12, 15-21 and 99, are not rendered obvious by Lebby in view of Herbst and further in view of Sass.

Similarly, claims 13 and 14, which depend from claim 10, are not rendered obvious by Lebby in view of Herbst in view of Sass and further in view of Raw. Raw

does not cure the deficiencies of the combination of Lebby, Herbst, and Sass as outlined above. Further, claims 99-101 are also not rendered obvious by Lebby in view of Herbst in view of Sass and further in view of any one of Webber, Usui, or Klein. Claims 99-100 depend from claim 10. Webber, Usui, and/or Klein do not cure the deficiencies of the combination of Lebby, Herbst, and Sass regarding the principles of operation of Lebby as outlined above.

Further, claim 108 stands rejected as being unpatenable over Lebby in view of Herbst and further in view of Sass. Applicants submit that Lebby, Herbst and Sass do not disclose, teach, or suggest all the features of claim 1 or the claims that depend therefrom. Claim 108 depends from claim 1. Therefore, Lebby, Herbst and Sass, either alone or in combination, do not render obvious claim 108.

For reasons stated above, claims 1-4, 10-21, 97-101, and 108 are not rendered obvious by the cited of prior art. Therefore, the rejections of claims 1-4, 10-21, 97-101, and 108 should be withdrawn and the claims allowed at this time.

CONCLUSION

In light of the above amendments and remarks, it is respectfully submitted that the present application is now in proper condition for allowance, and an early notice to such effect is earnestly solicited.

If any small matter should remain outstanding after the Patent Examiner has had an opportunity to review the above Remarks, the Patent Examiner is respectfully

requested to telephone the undersigned patent attorney in order to resolve these matters and avoid the issuance of another Official Action.

DEPOSIT ACCOUNT

A check in the amount of $450.00 is enclosed. However, the Commissioner is hereby authorized to charge any deficiencies of payment or credit any overpayments associated with the filing of this correspondence to Deposit Account No. **50-0426**.

Respectfully submitted,

JENKINS, WILSON, TAYLOR & HUNT, P.A.

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